Chapter 14
Cultural Resources

This chapter describes the affected environment and environmental consequences related to cultural resources for the dam and reservoir modifications proposed under the SLWRI. More detailed discussion of cultural resources is presented in *Cultural Resources Alternatives Assessment for the Shasta Lake Water Resources Investigation, Shasta and Tehama Counties, California* (Byrd et al. 2008) and *Native American Tribal Coordination, Shasta Lake Water Resources Investigation, California* (Nilsson et al. 2008), which were prepared for the project. These Technical Reports will not be publicly distributed because they contain confidential information on the locations of cultural resources.

14.1 Affected Environment

For the purposes of the cultural resources assessment, studies were limited to the Shasta Lake and vicinity (77,088 acres) and the upper Sacramento River (16,113 acres), for a total of 93,201 acres (see Byrd et al. (2008) for a complete discussion of the study area extent by alternative). Project impacts to cultural resources are not expected to extend beyond this primary study area. Shasta Lake and vicinity includes the existing reservoir, the maximum inundation area, and a 0.25-mile buffer. The 0.25-mile buffer encompasses the area around the reservoir where infrastructure would need to be relocated (recreation facilities, roads, utilities, trails, etc.).The upper Sacramento River is defined by the 100-year floodplain from Keswick Dam, north of Redding, southward to the Red Bluff Diversion dam.

To evaluate the potential effects that the proposed undertaking may have on cultural resources within the 93,201-acre study area, archival and records searches were conducted. Information concerning potential Native American concerns within the study area was gathered from historic and ethnographic literature and from initial discussions with tribes and Native American individuals. The results of these efforts are summarized below, following a brief discussion of the regional context.

14.1.1 Regional Setting

This section provides a regional framework of the study area including sections on the prehistoric, ethnohistorical, and historical context of the study area. Because of the regional nature of cultural resources, the Shasta Lake vicinity and upper Sacramento River area are discussed together.

Prehistoric Context

The following presentation provides a temporally organized discussion of the archaeological record. There is a long history of archaeological investigations in the upper Sacramento Valley region, although the early investigations were sporadic rather than sustained research programs. Notably, a great deal of fieldwork has been carried out around Shasta Lake, largely on USFS lands. Radiocarbon dating and temporally diagnostic artifacts have been used to create a framework for understanding the age of cultural resources in the area as well as changes through time. This framework provides baseline information on how cultural resources can contribute to history and regional research issues.

The Terminal Pleistocene time segment (ca. 13,500-11,600 before present, calibrated using radiocarbon dating (cal BP)) is minimally represented and poorly understood in this region. What little evidence exists suggests that people passing through the area were wide-ranging, mobile hunters and gatherers who periodically exploited large game (Haynes 2002). Archaeological data from this time period, primarily represented by isolated fluted and/or bifacially thinned spear points and Pleistocene fauna remains, is limited to two cave sites in the study area.

The earliest evidence for occupation of the region largely falls between ca. 8000-5000 BP. Most assemblages dating to this interval are affiliated with the Borax Lake Pattern (Fredrickson 1974) and include wide-stemmed projectile points, handstones, milling slabs, ovoid flake tools, along with a variety of other utilitarian items. The diversified nature of these artifact assemblages indicates people occupying the area were likely foragers who moved their residential bases frequently to exploit seasonal changes in resource distribution (Hildebrandt and Hayes 1983, 1993; Kowta et al. 2000; Sundahl and Henn 1993).

Several new projectile point forms appeared in the archaeological record around 5000 BP, including Squaw Creek Contracting-stemmed, Pollard Diamond-shaped, and McKee series. These points have been assigned to the Squaw Creek Pattern (5700-3200 BP) by Sundahl (1992b). Despite the appearance of these new forms, similarities in the rest of the assemblage composition with the preceding Borax Lake Pattern suggest people occupying the area during this time period were also relatively mobile foragers (Basgall and Hildebrandt 1989, Kowta et al. 2000).

A major change in the regional settlement-subsistence pattern appears to have occurred between ca. 4,000 to 1,600 years ago. This period has been identified as the Whiskeytown Pattern (Sundahl 1992b), and is represented by a wide range of corner- and side-notched projectile points assigned to the Clikapudi series, as well as hand stones, milling slabs, notched pebble net weights, and mortars and pestles (see also the Deadman and Kingsley complexes in Tehama County; Greenway 1982, Johnson 1984). Analysis of data from archaeological sites dating to this time period, has led Basgall and Hildebrandt (1989) to propose a shift from the preceding generalized forager strategy to a "fission-fusion" model of subsistence-settlement where larger groups of people occupied residential camps during the fall and winter months, but then split into smaller foraging groups who moved between productive resource patches during the remainder of the year. The fall-winter residential sites are thought to have been concentrated along the northern Sacramento Valley foothills, where salmon and acorns could be readily obtained (Baker 1990, Bevill and Nilsson 1993, Sundahl 1999).

Two distinct patterns have been identified as corresponding with the most recent time period (from 1,600 years ago to contact) in the region. The first, referred to as the Augustine Pattern/Shasta Complex, is thought to reflect a more sedentary subsistence-settlement adaptation than what was practiced in the preceding time periods. Initially, from 1,250 to 750 years ago, square-stemmed Gunther Barbed projectile points (with lower frequencies of expanding-stem variants), winged drills, bipointed fish gorges, bone gaming pieces, incised bone pendants, and varied shell beads are characteristic. These materials have been associated with the arrival of the Wintu in Northern California, and are thought to reflect a sedentary adaptation made possible by a subsistence system dependent on the large-scale storage of salmon and acorns (Broughton 1988; George 1981; Sundahl 1982, 1992a; Wohlgemuth 1992).

During this same time frame, a contrasting record is found in upland areas surrounding the northern Sacramento Valley. It is represented by much smaller sites and rather simple assemblages consisting of small side- and corner-notched projectile points, a limited number of Gunther series forms, hopper mortars and pestles, hand stones, milling slabs, and notched pebble weights. On the east side of the valley, these findings are assigned to the Tehama Pattern (Clewett and Sundahl 1982, Sundahl 1992a), and are thought to reflect a more mobile pattern of settlement by populations speaking Hokan languages (e.g., Yana) pushed to the hinterlands by the late-arriving Wintu, who ultimately restricted access to the Sacramento River.

Ethnohistorical Context

Ethnohistorical investigations indicate that at the end of the prehistoric era and into the historic era, much of the study area was primarily occupied by the Wintu (LaPena 1978), but some of their territorial boundaries have been contested for many years. The most commonly accepted map of Wintu territory was produced by Du Bois (1935), and shows that the Wintu controlled the

Sacramento, McCloud, and Squaw Creek drainages, and all but the easternmost segment of the Pit River Arm. This arm crosses into a boundary area between Northern Yana (Johnson 1978, Sapir and Spier 1943) and Achomawi (Pit River) tribes (Olmsted and Stewart 1978). Wintu people also lived along the Sacramento River from Shasta Dam down to the confluence of the river with Cottonwood and Battle creeks. Nomlaki territory took over south of Cottonwood Creek/Battle Creek and extended down past what is now the Red Bluff Diversion Dam (Goldschmidt 1951, 1978).

There has been a great deal of ethnohistoric and ethnographic discussion of the Wintu owing largely to the records amassed by late nineteenth- and early twentieth-century observers. Therefore, the Wintu can be considered one of the best known Native American groups in California. Most of the villages were located on the McCloud and Pit rivers and the general area south of the Pit River to just south of Redding. One hundred and six (43 percent) of the named Wintu ethnographic villages fall within the current study area.

Historical Context

The area that would become Shasta and Tehama counties was not explored by Europeans during the Spanish period of California history. Initial exploration occurred in 1821 when a Mexican expedition explored the Sacramento River nearly as far north as the future site of Redding, encountering Native populations as they traversed the region. Subsequently, European trappers in Northern California spread European diseases that had disastrous effects on the Native Americans. Notably, a devastating epidemic spread through the Sacramento Valley during the 1830s that may have killed as much as 75 percent of the native population.

In 1848, mining (especially for copper) began along the Trinity River and other Sacramento River tributaries, bringing as many as 50,000 people to the area. American immigrants increasingly occupied territory, and new logging and mining operations destroyed hunting grounds and salmon fisheries that were part of the traditional home of Native Americans such the Wintu. Criminal violence and the policy of relocation to reservations nearly eliminated the Native American population in the upper Sacramento River Valley by 1870. Those who remained lived in the mountains, like the Wintu, who maintained a salmon fishery along the McCloud River.

The mining boom lead to the construction of smelters, mills, and towns (such as Keswick) that flourished in the late 1800s and early 1900s. Falling copper prices, growing environmental concerns over pollution from smelters, and the U.S. Government’s efforts at protection and conservation of public lands ended major operations by the 1920s.

Logging started in 1852 and included sugar pine, white pine, red fir, and cedar. Sawmills quickly sprang up, along with associated roads. Transporting logs and milled lumber became easier after the completion of the railroad through Red

Bluff and Redding, and the Blue Ridge Flume, completed in 1874. These transportation advances allowed lumber milling to be concentrated in the valley, and Red Bluff and other mill towns to thrive.

Agriculture dominated the valley land along the Sacramento River. Cattle farming was key initially, and remained an important product in the area through the mid-twentieth century, especially with the development of the dairy industry. Early settlers practiced dry farming, growing wheat and fruit, including peaches, pears, and plums. Farmers later diversified and transitioned from wheat to fruits, nuts, vineyards, and vegetable crops in the late 1800s through the 1920s. Ultimately, intensive irrigated agriculture dominated the area.

Throughout the historic era, transportation was an important focus of infrastructure development. Over time, foot travel and transportation by horse or stage coach on a number of historic trails gave way to river, railroad, and ultimately, automobile travel. Hopeful settlers and miners poured into the study area along the California-Oregon Trail between 1840 and 1860, passing thorough the upper Sacramento River and Pit River valleys. A segment of the Siskiyou Trail was used by the northern railroad in 1877 and Interstate 5 follows this route today. Many early roads in the study area operated in conjunction with ferries across the Sacramento River. Several important bridges are located in the study area, along with the remains of many others, including the Centennial Bridge in Red Bluff and the Dog Creek Bridge in Shasta County.

Towns such as Red Bluff, Redding, Keswick, and Kennett boomed, along with the region's developing transportation network. The construction of Shasta and Keswick dams promoted a new period of prosperity that carried through the expansion of the lumber industry and the rise of the recreation industry in the mid-twentieth century.

Efforts to preserve the Nation's forests began in the late 1800s. The Shasta Forest Reserve was created in 1905. The area also included many homesteads and Indian allotments granted to local Wintus in the 1880s. In preparation for inundation by Shasta Lake, the United States purchased land including these allotments, homesteads, and many other properties in the late 1930s. Around the same time, fish were recognized as an important natural resource in California, and the first of several salmon fish hatcheries were constructed in 1872 at the salmon spawning grounds near the confluence of the McCloud and Pit rivers.

Recreation, especially in the mountains, also played an important role in the region's history. In the early twentieth century, private fishing clubs, such as the Bollibokka Club, flourished. In the 1930s, USFS began to encourage the recreational use of the forests by the broader public, constructing campgrounds and picnic areas. Recreation in the national forests expanded with the formation

of Shasta Lake. New campgrounds were added, along with boat launches and access roads.

Hydroelectric power and water storage were also important facets of the region's history. Starting in 1922, Pacific Gas and Electric Company built dams and power plants in the Pit River area. In 1935, the Federal Government decided to proceed with building the Central Valley Project to store and deliver Sacramento River water as far south as Fresno County. Work was completed in the 1940s at Shasta Dam and Keswick Dam and Powerhouse, located downriver from Shasta Dam. Power generated at Shasta Dam and transmitted to the Central Valley Project pumps provided electricity to supply the lift pumps raising water into the main canal system. The system used the natural channels of the Delta to move water from Redding to Tracy, the head of the Delta-Mendota Canal.

14.1.2 Archaeological Resources and Historical Structures

This section discusses known archaeological resources and historic structures within the primary study area.

Shasta Lake and Vicinity

A total of 134 cultural resources studies has been previously conducted that intersect or are fully contained within the Shasta Lake area. Of these, 80 percent were surveys, the remainder being overview/research designs, excavations, or other compliance reports. More than half of the surveys are considered to have had systematic coverage; the rest were either reconnaissance efforts or the methods were unknown. Overall, only 8 percent of the study area has been surveyed; 5 percent in a systematic manner and 3 percent using reconnaissance methods.

The records search identified 261 cultural resources within the study area, including 190 prehistoric sites, 45 historic-era resources, and 26 resources with both prehistoric and historic-era components.

The 215 recorded prehistoric-era resources and components are widely distributed throughout the study area and include the following:

- Forty-two major residential sites
- Thirty-seven residential sites
- Fifty-five artifact scatters
- Seventy-seven scatters of flaked stone tools and manufacturing debris
- Two caves
- Two sites of unknown character

The 71 recorded historic-era resources and components include the following:

- Thirteen structures, including seven bridges, one dam, one railroad bridge and grade, one aerial-tramway, one rock wall/alignment complex, one building foundation, and one concentration of wooden A-frames
- Seven linear features consisting of one railroad, five road segments and one line of wooden poles
- Seven mining locales that include two quarries and five sites with various mining-related features and residential elements.
- Fifteen artifact scatters
- Two ranching complexes
- Fourteen residential sites
- Two town complexes – both are mining-related and one includes a cemetery
- Two orchards represented by wooden poles and fruit trees
- One cemetery represented by two grave stones
- Seven historic-era Native American cemeteries, all but one of which is also associated with a major prehistoric residential component. Each of these cemeteries was subject to government removal of burials and reburial in a government cemetery outside the Shasta Lake inundation area
- One historic-era Native American residential site that also has a prehistoric residential component

Another 19 historic-era cemeteries (containing both Native American and Euro-American burials) within the footprint of Shasta Lake have not been formally recorded. They were subject to burial removal and subsequent reburial outside the reservoir area. It is possible that a number of these cemeteries may retain additional human remains, and are potentially subject to periodic exposure when the reservoir level fluctuates.

The Dog Creek Bridge is currently listed on the National Register of Historic Places (NRHP). The NRHP is the Nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and

archeological resources. Properties listed in the NRHP include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. All properties and districts listed in or determined eligible for listing in the NRHP must be considered in the planning of Federal undertakings. Shasta Dam and property has been determined eligible for the NRHP as part of the Central Valley Project through a consensus determination with the State Historic Preservation Officer (SHPO). Another 24 resources have been determined ineligible by consensus determination with SHPO. These include 15 historic-era resources, seven prehistoric sites, and two resources with both prehistoric and historic-era components.

Upper Sacramento River (Keswick Dam to Red Bluff)

Based on the records search results, 97 cultural resources studies intersect or are fully contained within this area. Of these, 86 percent are surveys, along with overviews, excavation reports, and historical architectural evaluation reports. Most of the surveys had systematic coverage methods (75 percent). In all, 23 percent of the area has been surveyed, mostly by systematic methods (15 percent), and the rest by reconnaissance methods.

A total of 79 recorded cultural resources fall within this area. These include 45 prehistoric sites, 20 historic-era resources, and 14 resources with both historic-era and prehistoric components.

The 59 prehistoric resources and components within the study area include the following:

- Thirteen major residential sites
- Twenty-two residential sites
- Seven rock shelters
- Five artifact scatters.
- Five flaked stone tool and manufacturing debris scatters
- Four rock art (petroglyph) sites
- Three sites of unknown character

The recorded prehistoric sites are concentrated in the southern portion of the study area, from Battle Creek near Table Mountain southward (71 percent), along with a small concentration of sites at the northern end of the upper Sacramento River area near Redding (18.6 percent). Eleven prehistoric sites have been subjected to some form of archaeological excavation.

The 34 recorded historic-era resources and components within the study area include the following:

- Ten structures
- Seven linear features consisting of five roads, one wagon train, and a powerline
- Five flume remnants (two of which were associated with orchards)
- Three mining locales, including a mining complex and two adits
- Five artifact scatters
- One ranching complex
- The historic-era structures include five bridges, a ferry crossing, a rock wall, a dam, one concrete dance pavilion, and a power substation building complex
- Three historic-era Native American residential sites

One archaeological site (referred to as the Benton Track Site or *Magmas*) is currently listed on the NRHP. In addition, the Diestelhorst Bridge in Redding and the Anderson-Cottonwood Irrigation District Diversion Dam have been determined eligible for the NRHP. Two sites are listed as ineligible for the NRHP by the California Office of Historic Preservation.

Native American Traditional Cultural Properties and Sacred Sites

A traditional cultural property is generally defined based on its association with cultural practices or beliefs of a living community rooted in a community's history, and are important in maintaining community cultural identity (Parker and King 1998). Executive Order No. 13007 defines a sacred site as "any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site."

The records search at the Information Center revealed that no traditional cultural properties have been formally recorded. The Native American Heritage Commission (NAHC) reviewed its sacred lands file and identified sacred land filings within the study area. Their locations are confidential.

There is a strong likelihood that additional traditional cultural properties are present within the study area based on ethnohistoric data and initial discussions with Native Americans. The study area was the focus of intensive Native American occupation during historic times, with a variety of religious, economic, historic, and other values identified by Native American groups. Ten

groups, including those listed by the Native American Heritage Commission, represent Native American interests in the study area. They include the following: Grindstone Indian Rancheria, Paskenta Band of Nomlaki Indians, Pit River Environmental Council, Pit River Tribe of California, Redding Rancheria, Shasta Nation, United Tribe of Northern California, Inc., Winnemem Wintu Tribe, Wintu Educational and Cultural Council, and the Wintu Tribe of Northern California. Notably, the Winnemem Wintu and the Pit River tribes live within the Shasta Lake area, where they continue to actively practice many aspects of their traditional culture. Both groups have related that a complex cultural landscape of village sites, ceremonial areas, sacred sites, burial sites, and resource areas intersects the study area.

Tribal consultation has clearly indicated that all local Native American groups are deeply concerned regarding the environmental and cultural effects of the project. Native Americans who supplied information for the SLWRI were, by and large, unwilling to provide comprehensive information on traditional cultural properties within the study area at this point in the investigation. They did, however, provide some general information on the number of potential traditional cultural properties (TCP) in the general region and these statements are well supported by ethnohistoric studies.

Members of the Pit River Madesi Band stated that 22 ethnographic villages and associated burial grounds are located within the existing reservoir and proposed reservoir areas. One tribal member also noted that several TCPs exist within the Pit 6 and Pit 7 Dam areas.

The Winnemem Wintu have identified important localities within the study area, many of which are locations where ceremonies are regularly conducted. Along the McCloud River, these include Children’s Rock, Coyote Rock, Dekkas Rock, doctoring pools near Nawtawaket Creek, Eagle Rock and Samwel Cave, Hirz Bay, *Kaibai* village, North Gray Rocks, Puberty Rock, Saddle Rock, and *Watawacket* village and spiritual area. Along the Sacramento River, important localities include the Antlers area, Delta area, Doney Creek, Gregory Creek, LaMoine area, Packers Bay, Pollard’s area, middle Salt Creek, and Sims area. The Winnemem Wintu have strong traditional and contemporary connections with the land, and their ongoing use of many archaeological and religious sites is fundamental to the well-being of their culture, particularly the education of their youth.

The Winnemem Wintu have also documented the location of some 155 ancestral villages within the Shasta Lake area. At least 81 village locations are known along the lower McCloud River and lower Pit River. An additional 73 villages are known to have existed on the eastern side of the Sacramento River. These village locations once contained between one and 30 houses each, some had associated cemeteries, and each had a power place. Some of these villages are already under the waters of Shasta Lake, while others are just above the

current Shasta Lake water level. The Winnemem Wintu have estimated that 120 of the known villages are still accessible (above the current high-water line).

14.2 Regulatory Framework

Under Federal and State law, effects to significant cultural resources—which include archaeological remains, historic-period structures, and traditional cultural properties—must be considered as part of the environmental analysis of a proposed project. Federal guidelines define TCPs as those that have "association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1998). Examples of traditional cultural properties include: a location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world; a location where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice.

Criteria for defining significant cultural resources are stipulated in 36 Code of Federal Regulations (CFR) Part 60.4 (Determinations of Eligibility for Inclusion in the National Register of Historic Places); the National Historic Preservation Act (NHPA) of 1966, as amended (NHPA; 16 U.S. Code (USC) 470 et seq.); and the California Environmental Quality Act (CEQA, revised 2005). Both NHPA and CEQA are applicable to Federal projects in California. In addition, 36 CFR 800 outlines the compliance process for Section 106 of the NHPA. Eligible properties are those which "(a)...are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent a significant and distinguishable entity whose components may lack individual distinction; or (d) that have yielded, or may be likely to yield, information important in prehistory or history" (36 CFR 60.4).

14.2.1 Federal

Under Section 106 of the NHPA, Federal agencies must consider effects to eligible resources ("historic properties") from the proposed undertaking, in consultation with SHPO and other parties. This includes identification (usually through archival research, field inventories, public interpretation, and/or test evaluations) of cultural resources eligible for the NRHP, assessment of adverse effects to eligible properties, and resolution of adverse effects. The revised regulations emphasize consultation with appropriate Native American communities (in the case of prehistoric, ethnographic, or traditional cultural properties), and the preparation of Memoranda of Agreement (MOA) among involved agencies and parties.

Native American burials are also protected by Federal law. The Native American Graves Protection and Repatriation Act (Public Law 101-601; 25 USC 3001-3013) protects Native American burial sites and controls the removal of human remains, funerary objects, sacred objects, and items of cultural patrimony on Federal and tribal lands.

The American Indian Religious Freedom Act (42 USC Section 1996) states that it is the policy of the United States to "protect and preserve for American Indians their inherent right of freedom to exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites." The provisions of American Indian Religious Freedom Act guarantee access to traditional sites on Federal lands and noninterference with religious practices. Consultation under American Indian Religious Freedom Act with American Indian groups can simultaneously satisfy the requirements of NEPA as well.

Indian Sacred Sites as also addressed in Executive Order 13007 (24 May 1996) and establishes that Federal agencies are responsible for allowing American Indian religious practitioners access to and ceremonial usage of sacred American Indian sites on Federal land. The agency will keep the locations of such sites confidential and will avoid adversely affecting the integrity of these sites.

14.2.2 State

Under CEQA, the lead non-Federal agency (state, county, city, or other) must consider potential effects to important or unique cultural resources. While the language and consultation process is somewhat different between the NHPA and CEQA, the definitions of eligible properties and of adverse impacts are essentially the same. Evaluations under CEQA consider a resource's potential eligibility to the California Register of Historical Resources.

California law also protects Native American burials, skeletal remains, and associated grave goods regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains (California Health and Safety Code Section 7050.5, California Public Resources Code Sections 5097.94 et seq.).

14.2.3 Regulatory Compliance

Currently, there is no undertaking authorized by Congress involving the raising of Shasta Dam. Reclamation has initiated the Section 106 process to notify the SHPO and Native American groups of the study and to begin the consultation process to obtain information regarding Native American cultural resources in the study area. If a project involving raising of the dam is authorized by Congress, the Section 106 process would continue with additional efforts to refine an area of potential effect (APE) and further identify historic properties. Initially, a complete inventory of cultural resources would be conducted within

the APE of the selected alternative. The APE would include, at a minimum, the new inundation area, construction areas (including dam construction and ecosystem enhancements), staging areas, and facility and utility relocations. Additional investigations would likely include the following:

- Archaeological survey of previously unsurveyed areas to inventory surface sites, including areas sensitive for buried resources
- Historic archival investigations to place historic-era sites in a local context
- Ethnographic and ethnohistoric investigations to obtain greater detail regarding areas of importance to Native American tribes and groups
- Evaluations to determine whether cultural resources identified within the APE are eligible for inclusion in the NRHP, assess potential adverse effects to historic properties, and consult in an effort to resolve any identified adverse effects

Cultural resources are evaluated for inclusion in the NRHP based on criteria found at 36 CFR Part 60. Typically, the cultural resources consultant provides eligibility recommendations, and Reclamation makes determinations of eligibility in consultation with SHPO, the public (if they are consulting parties) and tribes (for sites of religious or cultural significance). In this process, previous determinations of eligibility may need to be reevaluated because of the passage of time or other factors, and it is important to acknowledge the special expertise of Indian tribes when assessing the eligibility of properties to which they attach ceremonial and cultural significance. It would be possible to evaluate some cultural resources with survey-level data. However, test excavations would be required to accurately evaluate many archaeological resources to determine if they are, in fact, historic properties.

Reclamation is required to consider the effects of any potential project on historic properties within the APE. The criteria for assessing adverse effects are found in 36 CFR Part 800.5(a)(1), which states that “an adverse effect is found when an undertaking may alter, directly or indirectly, any characteristic of a historic property that qualify the property for inclusion in the National Register…” Examples of adverse effects include physical destruction, alteration, a change in the property’s setting, or the introduction of visual, atmospheric, or audible elements that diminish the integrity of the property’s significant historic features (36 CFR Part 800.5(a)(2)).

As part of the Section 106 process, Reclamation is responsible for making a finding regarding whether the undertaking would have an adverse effect on historic properties. This assessment of adverse effects is made in consultation with SHPO and Indian tribes that attach religious and cultural significance to

identified historic properties. Reclamation would then seek concurrence from SHPO on the determination of effect.

Consultation then continues among Reclamation, SHPO, and other consulting parties on possible options for avoiding, minimizing, or mitigating the adverse effects. This includes notifying the Council when adverse effects are found and inviting the Council to participate. Archaeological data recovery excavation is the most frequent way to resolve or mitigate adverse effects on historic properties determined eligible under Criterion D. Properties determined eligible under Criteria A through C typically require more varied actions to resolve adverse effects. If SHPO, Reclamation, and the Council (if participating) agree to measures to resolve adverse effects to historic properties, these are formalized in an MOA. Other consulting parties may be invited to sign the MOA. The Section 106 process is completed once the terms of the MOA have been met. In rare cases, if consultation fails to result in agreement on resolving adverse effects, consultation may be terminated pursuant to the process detailed in 36 CFR Part 800.7

14.3 Environmental Consequences and Mitigation Measures

This chapter is organized by the project alternatives described in Chapter 2, "Alternatives," and discusses environmental consequences associated with implementation of the project alternatives. It also describes potential mitigation measures associated with impacts to cultural resources that are significant or potentially significant.

The environmental setting for this chapter includes only the primary study area, Shasta Lake and vicinity, and the upper Sacramento River between Keswick and the Red Bluff Diversion Dam, as explained in Section 14.1. No potential impacts are expected in the extended study area; therefore, cultural resources investigations were conducted only in the primary study area. The extended study area is not discussed further in this section.

14.3.1 Impact Assessment Methods and Assumptions

The standard Section 106 process of the NHPA follows a series of steps that are described in the 36 CFR Part 800 regulations that implement the NHPA. These steps are as follows:

- Initiate Section 106 Process, 36 CFR Part 800.3
- Identify Historic Properties, 36 CFR Part 800.4
- Assess Adverse Effects, 36 CFR Part 800.5
- Resolve Adverse Effects, 36 CFR Part 800.

In the event that historic properties within the APE for an undertaking would be subject to adverse effects, the Section 106 process is most often completed with

the signing of an agreement document specifying measures that will be taken to avoid, minimize, or mitigate those effects.

The SLWRI is a feasibility-level study, and there is no authorization for raising Shasta Dam at this time. Reclamation will not have a specific undertaking until such time as Congress makes a decision regarding whether to authorize a project that would involve raising the dam and appropriates funding for this purpose. Therefore, this feasibility study has gathered existing data and information that can be used in environmental documents to estimate the impact of the proposed action on historic properties or sites of cultural significance. The Section 106 regulations allow Federal agencies to conduct "nondestructive project planning activities before completing compliance with Section 106" (36 CFR Part 800.1[c]), and the regulations encourage Federal agencies to consider a broad range of alternatives during the planning process for the undertaking. Given the schedule for the feasibility study and the Environmental Impact Statement, and the sizes of the alternatives, cultural resource surveys for the purpose of Section 106 compliance will not be completed until such time as an alternative is selected and funding is authorized by Congress. In the interim, the assessment of effects to cultural resources presented in this document is based on existing knowledge of site locations and an analysis of the sensitivity of the study area to contain additional sites.

As part of compliance with 36 CFR Part 800 regulations, Reclamation conducted a records search for the APE to assess which portions of the APE have been previously inventoried, and to identify all previously recorded cultural resources. Methods used for the cultural resources analysis included archival records searches (that identified previously records sites, site records and Native American ethnographic studies), agency consultation, Native American consultations, and comparisons of the study alternatives. Information on archaeological and historical structures was obtained for sites within the primary study area that may be affected by alternative plans. Sensitivity analyses were also conducted for prehistoric and historic-era resources to address data gaps using methods tailored to each data set. Native American issues and resource locations within the primary study area were discussed during meetings with Native American groups and individuals.

Archaeological and Historic-Era Structural Resources

Overall, the frequency and distribution of formally recorded cultural resources within the study area gives only a limited and incomplete picture of the actual number of resources. This is mainly due to limited systematic surveys: 5 percent of the Shasta study area and 15 percent of the upper Sacramento River. As such, many cultural resources have not been identified or formally recorded.

A comparative sensitivity analysis was therefore conducted that took into account both documented and undocumented cultural resources (including archaeological sites and historic-era structures) for each of the alternatives proposed for raising Shasta Dam. The sensitivity analysis was restricted to the

Shasta Lake and vicinity, and did not include the upper Sacramento River since no impact differences between alternatives have been identified within this area.

Separate sensitivity analyses using methods tailored to each data set were conducted for prehistoric and historic-era sites to estimate the total number of cultural resources present within each alternative (see Byrd et al. (2008) for methodological details and specific data). The prehistoric sensitivity analysis used a weights-of-evidence quantitative analysis to predict the overall density and distribution of sites. In contrast, the historic-era sensitivity study gathered archival data (mainly maps) within the study area to make predictions regarding the number and type of potential unrecorded historic-era resources (both structures and sites) by alternative. Results of the prehistoric and historic-era sensitivity analyses were integrated to provide quantitative estimates of the total number of cultural resources after full inventory.

A second records search was completed to identify recorded cultural resources in specific areas of the upper Sacramento River where construction activities would take place in certain alternatives associated with ecosystem restoration, including spawning gravel augmentation and floodplain and riparian habitat restoration. For these construction areas, existing access roads were excluded, but a records search buffer of 0.125-mile was added to all other project elements. It should be noted that the proposed construction areas are concept-level, and may be relocated or deleted as a result of design development, consultation, or other factors.

Traditional Cultural Properties and Sacred Sites

Public and stakeholder coordination meetings were conducted on behalf of Reclamation with Native American tribal groups whose traditional territories overlap the study area. This included meetings and/or workshops with groups and individuals representing major tribes and/or extended family groups in the Shasta/Redding area regarding potential effects to cultural resources from a plan to enlarge Shasta Dam and Reservoir. The primary intent of these meetings was to strengthen communication with tribal groups and individuals; solicit, clarify, and document major concerns and issues; and establish a preferred method/ approach to maintaining effective communication during the remainder of the SLWRI and in future endeavors.

Federally recognized Native American tribes were invited to begin the consultation process at an information meeting, followed by additional contact by telephone to learn of their concerns regarding the SLWRI, and to gain an initial sense of where sensitive resource localities are situated within the primary study area. Non-Federally recognized Native American groups and individuals with an interest in the study area were also contacted. There were also in-person visits to tribal members to collect information.

Seven tribal groups were invited to an information meeting held on April 4, 2007, in Redding, California. The purpose of the meeting was to provide

general information about the SLWRI, initiate Section 106 consultation with groups desiring to participate in the project, and introduce Elena Nilsson, a consultant for Reclamation, as the Native American Tribal Coordination study lead. Invitations were sent to the following: Grindstone Rancheria, Paskenta Rancheria, Pit River Tribe, Redding Rancheria, Shasta Nation, Winnemem Wintu, and Wintu Tribe and Toyon-Wintu Center. The meeting was attended by representatives from the Winnemem Wintu and the Madesi Band of the Pit River Tribe.

From August 2007 to March 2008, nine meetings were held with Native American groups whose traditional territories overlap with the SLWRI study area. The purpose of the meetings was to solicit, clarify, and document major concerns and issues regarding the project, and to establish a preferred method/approach to maintaining effective communication during the remainder of the SLWRI study and in future endeavors. Five groups participated in these meetings, including the Grindstone Indian Rancheria (one meeting), Paskenta Band of Nomlaki Indians (one meeting), Pit River Tribe (three meetings), Shasta Nation (one meeting), and Winnemem Wintu (three meetings).

Currently, no traditional cultural properties are formally recorded at the Information Center. The Native American Heritage Commission, however, has stated that sacred sites are present in the study area. No additional investigations have been undertaken to identify and formally document traditional cultural properties in large part because Native American groups are unwilling to provide sufficiently detailed information at this stage in the study. Based on initial statements provided by Native Americans and previous ethnographic and ethnohistoric studies, it is predicted that a considerable number of traditional cultural properties are present in the study area.

14.3.2 Criteria for Determining Significance of Effects

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by, or result from, the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an Environmental Impact Statement must be prepared. An environmental document prepared to comply with CEQA must identify the potentially significant environmental effects of a proposed project. A "[s]ignificant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project (State CEQA Guidelines, Section 15382). CEQA also requires that the environmental document propose feasible measures to avoid or substantially reduce significant environmental effects (State and CEQA Guidelines, Section 15126.4(a).

Federal Criteria

Under Federal regulation (36 CFR Section 800(a)(1)):

> *"An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative."*

Examples of adverse effects (36 CFR Section 800(a)(2)) include the following:

- Physical destruction, damage, or alteration, including moving the property from its historic location
- Isolation from, or alteration of, the setting
- Introduction of intrusive elements
- Neglect leading to deterioration or destruction
- Transfer, sale, or lease from Federal ownership

State Criteria

California regulations require that effects to cultural resources must be considered only for resources meeting the criteria for eligibility to the California Register of Historical Resources, outlined in Section 5024.1 of the California Public Resources Code. Demolition, replacement, substantial alteration, or relocation of an eligible resource are all actions that could change those elements of the resource which make it eligible. The following significance criteria were developed based on guidance provided by the State CEQA Guidelines, and consider the context and intensity of the environmental effects as required under NEPA. Under the State CEQA Guidelines, impacts on cultural resources may be considered significant if a project alternative would result in any of the following:

- Cause a substantial adverse change in the significance of a historical resource, as defined in Guidelines Section 15064.5
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Guidelines Section 15064.5

- Disturb human remains, including those interred outside formal cemeteries

According to the above criteria, the project would be considered to have a significant impact on cultural resources if it would result in any of the following:

- Substantial adverse change in the significance of an historical resource
- Substantial adverse change in the significance of a unique archaeological resource
- Disturbance or destruction of unique paleontological resource or site or unique geologic feature
- Disturbance of any human remains, including those interred outside of formal cemeteries
- Elimination of important examples of the major periods of California history or prehistory

Statements of impact significance are relative to both existing conditions (Year 2005) and future conditions (Year 2030), unless stated otherwise. Only those elements of a resource which contribute to its eligibility need to be considered; effects to noncontributing elements are less than significant.

14.3.3 Direct and Indirect Effects

This section describes the environmental consequences of the SLWRI alternatives, and proposed mitigation measures for any impacts determined to be significant or potentially significant.

No-Action Alternative

Dam construction, infrastructure and facilities relocation, additional reservoir area inundation, and construction activities adjacent to the upper Sacramento River would not occur under the No-Action Alternative. Therefore, no additional traditional cultural properties or areas of concern above the current reservoir level would be impacted, and conditions would be the same as existing.

Shasta Lake and Vicinity

Impact Culture-1 (No-Action): Disturbance or Destruction of Archaeological and Historical Resources Due to Construction or Inundation Archaeological sites (as well as historic cemetery locations) within the existing Shasta Lake fluctuation zone will continue to be impacted by fluctuations in the height of the reservoir during ongoing operations with the No-Action Alternative. As stated above, dam construction, infrastructure and facilities relocation, and additional reservoir area inundation would not occur under the No-Action Alternative;

therefore, no impacts on cultural resources related to construction or inundation are expected. Mitigation is not required for the No-Action Alternative.

Impact Culture-2 (No-Action): Inundation of Traditional Cultural Properties and Sacred Sites Traditional cultural properties and sacred sites within the existing Shasta Lake fluctuation zone will continue to be impacted by fluctuations in the height of the reservoir during ongoing operations with the No-Action Alternative. As stated above, additional reservoir area inundation would not occur under the No-Action Alternative; therefore, no impacts on cultural resources related to inundation are expected. Mitigation is not required for the No-Action Alternative.

Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Culture-3 (No-Action): Disturbance or Destruction of Archaeological and Historical Resources near the Upper Sacramento River Due to Construction Archaeological sites (as well as historic cemetery locations) in or near the upper Sacramento River will continue to be impacted by water operations with the No-Action Alternative. As stated above, construction activities adjacent to the upper Sacramento River would not occur under the No-Action Alternative; therefore, no impacts on cultural resources related to construction are expected. Mitigation is not required for the No-Action Alternative.

CP1 – 6.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

Cultural resources potentially impacted by this alternative include those within: (1) the proposed additional 1,229-acre inundation area; (2) the portion of the proposed fluctuation zone for this alternative within the existing reservoir area; and (3) those portions of the 0.25-mile buffer around the reservoir where infrastructure would need to be relocated (recreation facilities, roads, utilities, trails, etc.). It should be noted that sites typically extend into the inundation and reservoir area for more than one alternative.

Shasta Lake and Vicinity

Impact Culture-1 (CP1): Disturbance or Destruction of Archaeological and Historical Resources Due to Construction or Inundation Raising Shasta Dam would have a direct impact on cultural resources. This impact would be significant. Sensitivity studies estimate that, with complete surveys, impacts associated with CP1 inundation and areas would include approximately 212±54 prehistoric resources (Table 14-1). The historic-era archival study documented 355 localities that may potentially contain historic-era remains within this inundation area.

Sensitivity studies estimate that, with complete surveys, the CP1 fluctuation zone would include approximately 675±172 prehistoric resources. The historic-era archival study documented 529 localities that may potentially contain historic-era remains.

Table 14-1. Cultural Resources Impacts for CP1

Inundation Area	
Prehistoric sites	212±54
Historic-era archival localities	355
Fluctuation Zone	
Prehistoric sites	675±172
Historic-era archival localities	529
0.25-Mile Buffer	
All cultural resources	Fewer than CP2

Note:
Mean prehistoric site estimates are based on weights-of-evidence quantitative analysis.
An undetermined number of sites will actually be subject to mitigation under NHPA Sec 106.

Sensitivity studies estimate that with complete surveys, the ¼-mile buffer area for CP1 would include approximately 728±212 prehistoric resources. The historic-era archival study documented 773 localities that may potentially contain historic-era remains. Although the full extent and locations of project impacts within the buffer zone related to construction are not yet available for CP1, impacts would occur within only a small percentage of the overall buffer zone concentrated near the reservoir.

Although it is impossible at this stage to say how many of these resources will be determined eligible for listing under NHPA, and how many of the eligible resources will sustain adverse impacts from this alternative, this impact would be significant. Mitigation for this impact is proposed in Section 14.3.1.

Impact Culture-2 (CP1): Inundation of Traditional Cultural Properties and Sacred Sites This impact would be significant and unavoidable. Due to the confidential nature of sacred land filings, it is unknown whether these locations are situated within the study area. Several tribal groups have identified traditional cultural properties and sacred sites that would be adversely impacted by CP1.

The NAHC identified sacred land filings within the study area. These locations are confidential, thus making it unclear whether or not they are situated within the CP1 area.

Two particularly important Winnemem Wintu locations that would be impacted by CP1 include Puberty Rock and the doctoring pools near Nawtawaket Creek. CP1 could submerge Puberty Rock, restricting the Winnemem Wintu from holding the puberty ceremony at this important location. Although Puberty Rock would still be accessible for portions of the year, when lake levels are lower, CP1 would increase the frequency of inundation. The relocation of the rock to higher ground is not possible, as, in the Winnemem worldview, its location is preordained and connected with the nearby “two sisters” mountain (Bollibokka Mountain). Puberty Rock also marks the location of an extensive village with housepits and burials. CP1 would inundate additional burials at this

location, which would require removal and relocation. The Winnemem Wintu have estimated that 120 ancestral villages still accessible above the current high waterline of Shasta Lake would be adversely impacted by CP1.

The Pit River Madesi Band members state that 22 ethnographic villages, associated burial grounds, and several TCPs are located within the existing reservoir and proposed inundation or fluctuation areas.

The local Native American community has identified several locations in the study area that they consider to be sacred; notable among these are Puberty Rock and the doctoring pools near Nawtawaket Creek. Inundation or other adverse impacts to these places likely cannot be mitigated because the importance of the identified properties and sacred sites is inextricably tied to physical location, and relocation of these features away from the inundation area is not possible.

Although it is impossible at this stage to say how many of these resources will be adversely impacted due to inundation as a result of implementing CP1, this impact would be significant and unavoidable. Mitigation for this impact is not available.

Upper Sacramento River (Shasta Dam to Red Bluff)
Impact Culture-3 (CP1): Disturbance or Destruction of Archaeological and Historical Resources near the Upper Sacramento River Due to Construction
Construction activities adjacent to the upper Sacramento River associated with downstream ecosystem enhancements would not occur under CP1; therefore, no impacts on cultural resources related to construction are expected. Mitigation for this impact is not needed, and thus not proposed.

CP2 – 12.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

Cultural resources potentially impacted by this alternative include those within (1) the proposed additional 1,734-acre inundation area, (2) the portion of the proposed fluctuation zone for this alternative within the existing reservoir area, and (3) those portions of the 0.25-mile buffer around the reservoir where infrastructure would need to be relocated (recreation facilities, roads, utilities, trails, etc.).

Shasta Lake and Vicinity
Impact Culture-1 (CP2): Disturbance or Destruction of Archaeological and Historical Resources Due to Construction or Inundation Raising Shasta Dam would have a direct impact on cultural resources. This impact would be significant. Sensitivity studies estimate that, with complete surveys, inundation associated with CP2 would include approximately 224±57 prehistoric resources (Table 14-2). The historic-era archival study documented 371 localities that may potentially contain historic-era remains within this inundation area.

Table 14-2. Cultural Resources Impacts for CP2

Inundation Area	
Prehistoric sites	224±57
Historic-era archival localities	371
Fluctuation Zone	
Prehistoric sites	675±172
Historic-era archival localities	529
0.25-Mile Buffer	
All cultural resources	Fewer than CP3

Note:
Mean prehistoric site estimates are based on weights-of-evidence quantitative analysis.
An undetermined number of sites will actually be subject to mitigation under NHPA Sec. 106.

Sensitivity studies estimate that, with complete surveys, the fluctuation zone for CP2 would include approximately 675±172 prehistoric resources. The historic-era archival study documented 529 localities that may potentially contain historic-era remains.

Sensitivity studies estimate that, with complete surveys, the 0.25-mile buffer zone for CP2 would include approximately 728±212 prehistoric resources. The historic-era archival study documented 773 localities that may potentially contain historic-era remains. Although the full extent and locations of project impacts related to construction activities within the buffer zone are not yet available for this alternative, they would occur within only a small percentage of the overall buffer zone concentrated near the reservoir.

Although it is impossible at this stage to say how many of these resources will be determined eligible, and how many of the eligible resources will sustain adverse impacts from CP2, this impact would be significant. Inundation or other adverse impacts to affected resources likely cannot be mitigated because the importance of the identified properties and sacred sites is inextricably tied to physical location, and relocation of these features away from the inundation area is not possible. Mitigation for this impact is proposed in Section 14.3.1.

Impact Culture-2 (CP2): Inundation of Traditional Cultural Properties and Sacred Sites Alternative CP2 is similar to Alternative CP1 with respect to its potential to cause or be affected by inundation. The NAHC identified sacred land filings within the study area. These locations are confidential, thus making it unclear whether or not they are situated within the CP2 area. For the same reasons that apply to CP1, this impact would be significant and unavoidable. Mitigation for this impact is not available.

Upper Sacramento River (Shasta Dam to Red Bluff)
Impact Culture-3 (CP2): Disturbance or Destruction of Archaeological and Historical Resources near the Upper Sacramento River Due to Construction
Construction activities adjacent to the upper Sacramento River associated with downstream ecosystem enhancements would not occur under CP2; therefore, no

impacts on cultural resources related to construction are expected. Mitigation for this impact is not needed, and thus not proposed.

CP3 – 18.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

Cultural resources potentially impacted by this alternative include those within (1) the proposed additional 2,497-acre inundation area, (2) the portion of the proposed fluctuation zone for this alternative within the existing reservoir area, and (3) those portions of the 0.25-mile buffer around the reservoir where infrastructure would need to be relocated (recreation facilities, roads, utilities, trails, etc.).

Shasta Lake and Vicinity

Impact Culture-1 (CP3): Disturbance or Destruction of Archaeological and Historical Resources Due to Construction or Inundation Raising Shasta Dam would have a direct impact on cultural resources. This impact would be significant. Sensitivity studies estimate that, with complete surveys, inundation associated with CP3 would include approximately 243±63 prehistoric resources (Table 14-3). The historic-era archival study documented 391 localities that may potentially contain historic-era remains within this inundation area.

Table 14-3. Cultural Resources Impacts for CP3

Inundation Area	
Prehistoric sites	243±63
Historic-era archival localities	391
Fluctuation Zone	
Prehistoric sites	675±172
Historic-era archival localities	529
0.25-Mile Buffer	
All cultural resources	Fewer than CP5, same as CP4

Note:
Mean prehistoric site estimates are based on weights-of-evidence quantitative analysis.
An undetermined number of sites will actually be subject to mitigation under NHPA Sec. 106.

Sensitivity studies estimate that, with complete surveys, the fluctuation zone for CP3 would include approximately 675±172 prehistoric resources. The historic-era archival study documented 529 localities that may potentially contain historic-era remains.

Sensitivity studies estimate that, with complete surveys, the 0.25-mile buffer zone for CP3 would include approximately 728±212 prehistoric resources. The historic-era archival study documented 773 localities that may contain historic-era remains. Although the full extent and locations of project impacts related to construction activities within the buffer zone are not yet available for this alternative, they would occur within only a small percentage of the overall buffer zone concentrated near the reservoir.

Although it is impossible at this stage to say how many of these resources will be determined eligible, and how many of the eligible resources will sustain adverse impacts from CP3, this impact would be significant. Inundation or other adverse impacts to affected resources likely cannot be mitigated because the importance of the identified properties and sacred sites is inextricably tied to physical location, and relocation of these features away from the inundation area is not possible. Mitigation for this impact is proposed in Section 14.3.1.

Impact Culture-2 (CP3): Inundation of Traditional Cultural Properties and Sacred Sites Alternative CP3 is similar to Alternative CP1 with respect to its potential to cause or be affected by inundation. The NAHC identified sacred land filings within the study area. These locations are confidential, thus making it unclear whether or not they are situated within the CP3 area. For the same reasons that apply to CP1, this impact would be significant and unavoidable. Mitigation for this impact is not available.

Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Culture-3 (CP3): Disturbance or Destruction of Archaeological and Historical Resources near the Upper Sacramento River Due to Construction Construction activities adjacent to the upper Sacramento River associated with downstream ecosystem enhancements would not occur under CP3; therefore, no impacts on cultural resources related to construction are expected. Mitigation for this impact is not needed, and thus not proposed.

CP4 – 18.5-Foot Dam Raise, Anadromous Fish Focus With Water Supply Reliability

Cultural resources potentially impacted by this alternative include those within (1) the proposed additional 2,497-acre inundation area, (2) the portion of the proposed fluctuation zone for this alternative within the existing reservoir area, and (3) those portions of the 0.25-mile buffer around the reservoir where infrastructure would need to be relocated (recreation facilities, roads, utilities, trails, etc.). CP4 also includes downstream ecosystem enhancements with spawning gravel augmentation and floodplain and riparian habitat restoration, both of which would entail construction activities adjacent to the upper Sacramento River.

Shasta Lake and Vicinity

Impact Culture-1 (CP4): Disturbance or Destruction of Archaeological and Historical Resources Due to Construction or Inundation Raising Shasta Dam would have a direct impact on cultural resources. This impact would be significant. Sensitivity studies estimate that with complete surveys, inundation associated with CP4 would include approximately 243±63 prehistoric resources (Table 14-4). The historic-era archival study documented 391 localities that may potentially contain historic-era remains within this inundation area.

Table 14-4. Cultural Resources Impacts for CP4

Inundation Area	
Prehistoric sites	243±63
Historic-era archival localities	391
Fluctuation Zone	
Prehistoric sites	601±154
Historic-era archival localities	524
0.25-Mile Buffer	
All cultural resources	Fewer than CP5, same as CP3

Note:
Mean prehistoric site estimates are based on weights-of-evidence quantitative analysis.
An undetermined number of sites will actually be subject to mitigation under NHPA Sec. 106.

Sensitivity studies estimate that, with complete surveys, the fluctuation zone for CP4 would include approximately 601±154 prehistoric resources. The historic-era archival study documented 524 localities that may potentially contain historic-era remains.

Sensitivity studies estimate that, with complete surveys, the 0.25-mile buffer zone for CP4 would include approximately 728±212 prehistoric resources. The historic-era archival study documented 773 localities that may potentially contain historic-era remains. Although the full extent and locations of project impacts related to construction activities within the buffer zone are not yet available for this alternative, they would occur within only a small percentage of the overall buffer zone concentrated near the reservoir.

Although it is impossible at this stage to say how many of these resources will be determined eligible, and how many of the eligible resources will sustain adverse impacts from CP4, this impact would be significant. Inundation or other adverse impacts to affected resources likely cannot be mitigated because the importance of the identified properties and sacred sites is inextricably tied to physical location, and relocation of these features away from the inundation area is not possible. Mitigation for this impact is proposed in Section 14.3.1.

Impact Culture-2 (CP4): Inundation of Traditional Cultural Properties and Sacred Sites Alternative CP4 is similar to Alternative CP1 with respect to its potential to cause or be affected by inundation. The NAHC identified sacred land filings within the study area. These locations are confidential, thus making it unclear whether or not they are situated within the CP4 area. For the same reasons that apply to CP1, this impact would be significant and unavoidable. Mitigation for this impact is not available.

Upper Sacramento River (Shasta Dam to Red Bluff)
Impact Culture-3 (CP4): Disturbance or Destruction of Archaeological and Historical Resources near the Upper Sacramento River Due to Construction This impact would be significant. Previous cultural resource studies indicated the presence of cultural resources in or near proposed downstream construction

areas related to spawning gravel augmentation and floodplain and riparian habitat restoration.

A total of 17 cultural resources have been recorded within the records search areas, consisting of eight prehistoric sites, six historic-era resources, and three resources with prehistoric and historic-era components. As mapped, thirteen of these cultural resources exist only in the 1/8-mile buffer areas, and only four of these cultural resources extend into proposed construction areas. It should be noted that the proposed construction areas are concept-level and may be relocated or deleted as a result of design development, consultation, or other factors.

Although it is impossible at this stage to say how many eligible resources will sustain adverse impacts from CP4, this impact would be significant. Mitigation for this impact is proposed in Section 14.3.1.

CP5 – 18.5-Foot Dam Raise, Combination Plan

Cultural resources potentially impacted by this alternative include those within (1) the proposed additional 2,497-acre inundation area, (2) the portion of the proposed fluctuation zone for this alternative within the existing reservoir area, and (3) those portions of the 0.25-mile buffer around the reservoir where infrastructure would need to be relocated (recreation facilities, roads, utilities, trails, etc.). CP5 also includes downstream ecosystem enhancements with spawning gravel augmentation and floodplain and riparian habitat restoration, both of which would entail construction activities adjacent to the upper Sacramento River.

Shasta Lake and Vicinity

Impact Culture-1 (CP5): Disturbance or Destruction of Archaeological and Historical Resources Due to Construction or Inundation Raising Shasta Dam would have a direct impact on cultural resources. This impact would be significant. Sensitivity studies estimate that, with complete surveys, inundation associated with CP5 would include approximately 243±63 prehistoric resources (Table 14-5). The historic-era archival study documented 391 localities that may potentially contain historic-era remains within this inundation area.

Sensitivity studies estimate that, with complete surveys, the fluctuation zone for CP5 would include approximately 675±172 prehistoric resources. The historic-era archival study documented 529 localities that may potentially contain historic-era remains.

Table 14-5. Cultural Resources Impacts for CP5

Inundation Area	
Prehistoric sites	243±63
Historic-era archival localities	391
Fluctuation Zone	
Prehistoric sites	675±175
Historic-era archival localities	529
0.25-Mile Buffer	
All cultural resources	Largest quantity

Note:
Mean prehistoric site estimates are based on weights-of-evidence quantitative analysis.
An undetermined number of sites will actually be subject to mitigation under NHPA Sec. 106.

Sensitivity studies estimate that, with complete surveys, the 0.25-mile buffer zone for CP5 would include approximately 728±212 prehistoric resources. The historic-era archival study documented 773 localities that may potentially contain historic-era remains. Although the full extent and locations of project impacts related to construction activities within the buffer zone are not yet available for this alternative, they would occur within only a small percentage of the overall buffer zone concentrated near the reservoir.

Although it is impossible at this stage to say how many of these resources will be determined eligible, and how many of the eligible resources will sustain adverse impacts from CP5, this impact would be significant. Inundation or other adverse impacts to affected resources likely cannot be mitigated because the importance of the identified properties and sacred sites is inextricably tied to physical location, and relocation of these features away from the inundation area is not possible. Mitigation for this impact is proposed in Section 14.3.1.

Impact Culture-2 (CP5): Inundation of Traditional Cultural Properties of Native American Concern Alternative CP5 is similar to Alternative CP1 with respect to its potential to cause or be affected by inundation. The NAHC identified sacred land filings within the study area. These locations are confidential, thus making it unclear whether or not they are situated within the CP5 area. For the same reasons that apply to CP1, this impact would be significant and unavoidable. Mitigation for this impact is not available.

Upper Sacramento River (Shasta Dam to Red Bluff)
Impact Culture-3 (CP5): Disturbance or Destruction of Archaeological and Historical Resources near the Upper Sacramento River Due to Construction This impact would be significant. Previous cultural resource studies indicated the presence of cultural resources in or near in proposed downstream construction areas related to spawning gravel augmentation and floodplain and riparian habitat restoration.

A total of 17 cultural resources have been recorded within the records search areas, consisting of eight prehistoric sites, six historic-era resources, and three

resources with prehistoric and historic-era components. As mapped, thirteen of these cultural resources exist only in the 1/8-mile buffer areas, and only four of these cultural resources extend into proposed construction areas. It should be noted that the proposed construction areas are concept-level and may be relocated or deleted as a result of design development, consultation, or other factors.

Although it is impossible at this stage to say how many eligible resources will sustain adverse impacts from CP5, this impact would be significant. Mitigation for this impact is proposed in Section 14.3.1.

14.3.4 Mitigation Measures

This section discusses mitigation measures for each significant impact described in the environmental consequences section, as presented in Table 14-6.

Table 14-6. Summary of Mitigation Measures for Cultural Resources

Impact		No-Action Alternative	CP1	CP2	CP3	CP4	CP5
Impact Culture-1: Disturbance or Destruction of Archaeological and Historical Resources Due to Construction or Inundation	LOS before Mitigation	NI	S	S	S	S	S
	Mitigation Measure	None required.	Mitigation Measure Culture-1: Comply with Section 106 of the NHPA.				
	LOS after Mitigation	NI	LTS	LTS	LTS	LTS	LTS
Impact Culture-2: Inundation of Traditional Cultural Properties and Sacred Sites	LOS before Mitigation	NI	SU	SU	SU	SU	SU
	Mitigation Measure	None required.	None available.				
	LOS after Mitigation	NI	SU	SU	SU	SU	SU
Impact Culture-3: Disturbance or Destruction of Archaeological and Historical Resources near the Upper Sacramento River Due to Construction	LOS before Mitigation	NI	NI	NI	NI	S	S
	Mitigation Measure	None required.	No mitigation needed; thus, none proposed.			Mitigation Measure Culture-3: Implement Mitigation Measure Culture-1: Comply with Section 106 of the NHPA.	
	LOS after Mitigation	NI	NI	NI	NI	LTS	LTS

Key:
LOS = level of significance
LTS = less than significant
NHPA = National Historic Preservation Act
NI = No Impact
S = significant
SU = significant and unavoidable

No-Action Alternative

No mitigation measures are required for this alternative.

CP1 – 6.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

As this alternative is likely to cause significant, adverse impacts to historic properties, it will be necessary to mitigate those impacts.

Mitigation Measure Culture-1 (CP1): Comply with Section 106 of the NHPA Process Reclamation is committed to and will comply with the Federal NHPA Section 106 consultation process to avoid, minimize, or mitigate any significant, adverse impacts to cultural resources and historic properties due to CP1, to the extent possible. The following measures, consisting of inventory, evaluation, and treatment processes, would be conducted by Reclamation as part of the environmental reviews to ensure compliance with Section 106 of the NHPA. Coordination will continue with the relevant Native American tribes and other interested parties in the area. The mitigation measures that would reduce the impacts of the site-specific studies to less than significant levels are:

- **Conduct Class III cultural resources surveys of portions of the project APE that have not been surveyed** – Before any ground disturbance takes place in the project area (including areas of ancillary activities, such as staging areas and access routes), Class III cultural resource surveys covering the APE would be conducted to locate and record cultural resources. Where appropriate, subsurface discovery efforts also would be undertaken to identify buried archaeological sites.

- **Plan activities to avoid known cultural resources** – Before carrying out ground-disturbing activities, areas that have been delineated as containing cultural resources would be demarcated, and all ground-disturbing or related activities would be planned to avoid these areas.

- **Evaluate significance of resources that cannot be avoided** – If cultural resources cannot be avoided through careful planning of the activities associated with an alternative, additional research or test excavation (as appropriate) would be undertaken to determine whether the resources meet NRHP and/or CEQA significance criteria.

- **Develop treatment process to mitigate effects of project upon significant resources** – Impacts on significant resources that cannot be avoided would be mitigated in a manner that is deemed appropriate for the particular resources. Mitigation for significant resources may include, but would not be limited to, data recovery, public interpretation, performance of a Historic American Building Survey or Historic American Engineering Record, or preservation by other means.

These impacts would be less than significant after mitigation. It is possible, however, that adverse impacts to traditional cultural properties likely cannot be mitigated. Therefore, these impacts are potentially significant and unavoidable.

CP2 – 12.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

As this alternative is likely to cause significant, adverse impacts to historic properties, it will be necessary to mitigate those impacts.

Mitigation Measure Culture-1 (CP2): Comply with Section 106 of the NHPA Reclamation is committed to and will comply with the Federal NHPA Section 106 consultation process to avoid, minimize, or mitigate any significant, adverse impacts to cultural resources and historic properties due to CP2, to the extent possible. The following measures, consisting of inventory, evaluation, and treatment processes, would be conducted by Reclamation as part of the environmental reviews to ensure compliance with Section 106 of the NHPA. Coordination will continue with the relevant Native American tribes and other interested parties in the area. The mitigation measures that would reduce the impacts of the site-specific studies to less than significant levels are:

- **Conduct Class III cultural resources surveys of portions of the project APE that have not been surveyed** – Before any ground disturbance takes place in the project area (including areas of ancillary activities, such as staging areas and access routes), Class III cultural resource surveys covering the APE would be conducted to locate and record cultural resources. Where appropriate, subsurface discovery efforts also would be undertaken to identify buried archaeological sites.

- **Plan activities to avoid known cultural resources** – Before carrying out ground-disturbing activities, areas that have been delineated as containing cultural resources would be demarcated, and all ground-disturbing or related activities would be planned to avoid these areas.

- **Evaluate significance of resources that cannot be avoided** – If cultural resources cannot be avoided through careful planning of the activities associated with an alternative, additional research or test excavation (as appropriate) would be undertaken to determine whether the resources meet NRHP and/or CEQA significance criteria.

- **Develop treatment process to mitigate effects of project upon significant resources** – Impacts on significant resources that cannot be avoided would be mitigated in a manner that is deemed appropriate for the particular resources. Mitigation for significant resources may include, but would not be limited to, data recovery, public interpretation, performance of a Historic American Building Survey or Historic American Engineering Record, or preservation by other means.

These impacts would be less than significant after mitigation. It is possible, however, that adverse impacts to traditional cultural properties likely cannot be mitigated. Therefore, these impacts are potentially significant and unavoidable.

CP3 – 18.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

As this alternative is likely to cause significant, adverse impacts to historic properties, it will be necessary to mitigate those impacts.

Mitigation Measure Culture-1 (CP3): Comply with Section 106 of the NHPA Reclamation is committed to and will comply with the Federal NHPA Section 106 consultation process to avoid, minimize, or mitigate any significant, adverse impacts to cultural resources and historic properties due to CP3 to the extent possible. The following measures, consisting of inventory, evaluation, and treatment processes, would be conducted by Reclamation as part of the environmental reviews to ensure compliance with Section 106 of the NHPA. Coordination will continue with the relevant Native American tribes and other interested parties in the area. The mitigation measures that would reduce the impacts of the site-specific studies to less than significant levels are:

- **Conduct Class III cultural resources surveys of portions of the project APE that have not been surveyed** – Before any ground disturbance takes place in the project area (including areas of ancillary activities, such as staging areas and access routes), Class III cultural resource surveys covering the APE would be conducted to locate and record cultural resources. Where appropriate, subsurface discovery efforts also would be undertaken to identify buried archaeological sites.

- **Plan activities to avoid known cultural resources** – Before carrying out ground-disturbing activities, areas that have been delineated as containing cultural resources would be demarcated, and all ground-disturbing or related activities would be planned to avoid these areas.

- **Evaluate significance of resources that cannot be avoided** – If cultural resources cannot be avoided through careful planning of the activities associated with an alternative, additional research or test excavation (as appropriate) would be undertaken to determine whether the resources meet NRHP and/or CEQA significance criteria.

- **Develop treatment process to mitigate effects of project upon significant resources** – Impacts on significant resources that cannot be avoided would be mitigated in a manner that is deemed appropriate for the particular resources. Mitigation for significant resources may include, but would not be limited to, data recovery, public interpretation, performance of a Historic American Building Survey or Historic American Engineering Record, or preservation by other means.

These impacts would be less than significant after mitigation. It is possible, however, that adverse impacts to traditional cultural properties likely cannot be mitigated. Therefore, these impacts are potentially significant and unavoidable.

CP4 – 18.5-Foot Dam Raise, Anadromous Fish Focus With Water Supply Reliability

As this alternative is likely to cause significant, adverse impacts to historic properties, it will be necessary to mitigate those impacts.

Mitigation Measure Culture-1 (CP4): Comply with Section 106 of the NHPA Reclamation is committed to and will comply with the Federal NHPA Section 106 consultation process to avoid, minimize, or mitigate any significant, adverse impacts to cultural resources and historic properties due to CP4 to the extent possible. The following measures, consisting of inventory, evaluation, and treatment processes, would be conducted by Reclamation as part of the environmental reviews to ensure compliance with Section 106 of the NHPA. Coordination will continue with the relevant Native American tribes and other interested parties in the area. The mitigation measures that would reduce the impacts of the site-specific studies to less than significant levels are:

- **Conduct Class III cultural resources surveys of portions of the project APE that have not been surveyed** – Before any ground disturbance takes place in the project area (including areas of ancillary activities, such as staging areas and access routes), Class III cultural resource surveys covering the APE would be conducted to locate and record cultural resources. Where appropriate, subsurface discovery efforts also would be undertaken to identify buried archaeological sites.

- **Plan activities to avoid known cultural resources** – Before carrying out ground-disturbing activities, areas that have been delineated as containing cultural resources would be demarcated, and all ground-disturbing or related activities would be planned to avoid these areas.

- **Evaluate significance of resources that cannot be avoided** – If cultural resources cannot be avoided through careful planning of the activities associated with an alternative, additional research or test excavation (as appropriate) would be undertaken to determine whether the resources meet NRHP and/or CEQA significance criteria.

- **Develop treatment process to mitigate effects of project upon significant resources** – Impacts on significant resources that cannot be avoided would be mitigated in a manner that is deemed appropriate for the particular resources. Mitigation for significant resources may include, but would not be limited to, data recovery, public interpretation, performance of a Historic American Building Survey or Historic American Engineering Record, or preservation by other means.

These impacts would be less than significant after mitigation. It is possible, however, that adverse impacts to traditional cultural properties likely cannot be mitigated. Therefore, these impacts are potentially significant and unavoidable.

Mitigation Measure Culture-3 (CP4): Implement Mitigation Measure Culture-1 (CP4): Comply with Section 106 of the NHPA This mitigation measure is the same as Mitigation Measure Culture-1 (CP4). Implementation of mitigation measure Culture-1 would reduce Impact Culture-3 (CP4) to a less than significant level.

CP5 – 18.5-Foot Dam Raise, Combination Plan

As this alternative is likely to cause significant, adverse impacts to historic properties, it will be necessary to mitigate those impacts.

Mitigation Measure Culture-1 (CP5): Comply with Section 106 of the NHPA Reclamation is committed to and will comply with the Federal NHPA Section 106 consultation process to avoid, minimize, or mitigate any significant, adverse impacts to cultural resources and historic properties due to CP5 to the extent possible. The following measures, consisting of inventory, evaluation, and treatment processes, would be conducted by Reclamation as part of the environmental reviews to ensure compliance with Section 106 of the NHPA. Coordination will continue with the relevant Native American tribes and other interested parties in the area. The mitigation measures that would reduce the impacts of the site-specific studies to less than significant levels are:

- **Conduct Class III cultural resources surveys of portions of the project APE that have not been surveyed** – Before any ground disturbance takes place in the project area (including areas of ancillary activities, such as staging areas and access routes), Class III cultural resource surveys covering the APE would be conducted to locate and record cultural resources. Where appropriate, subsurface discovery efforts also would be undertaken to identify buried archaeological sites.

- **Plan activities to avoid known cultural resources** – Before carrying out ground-disturbing activities, areas that have been delineated as containing cultural resources would be demarcated, and all ground-disturbing or related activities would be planned to avoid these areas.

- **Evaluate significance of resources that cannot be avoided** – If cultural resources cannot be avoided through careful planning of the activities associated with an alternative, additional research or test excavation (as appropriate) would be undertaken to determine whether the resources meet NRHP and/or CEQA significance criteria.

- **Develop treatment process to mitigate effects of project upon significant resources** – Impacts on significant resources that cannot be avoided would be mitigated in a manner that is deemed appropriate for

the particular resources. Mitigation for significant resources may include, but would not be limited to, data recovery, public interpretation, performance of a Historic American Building Survey or Historic American Engineering Record, or preservation by other means.

These impacts would be less than significant after mitigation. It is possible, however, that adverse impacts to traditional cultural properties likely cannot be mitigated. Therefore, these impacts are potentially significant and unavoidable.

Mitigation Measure Culture-3 (CP5): Implement Mitigation Measure Culture 1 (CP5): Comply with Section 106 of the NHPA This mitigation measure is the same as Mitigation Measure Culture-1 (CP5). Implementation of mitigation measure Culture-1 would reduce Impact Culture-3 (CP5) to a less than significant level.

14.3.5 Cumulative Effects

It is not possible to predict all future impacts to cultural resources within the study area. However, given the large number of archaeological sites and Native American sacred areas (villages, cemeteries, and ceremonial places) that have already been inundated by the reservoir, it is likely that raising Shasta Dam by any height would have a significant cumulative effect to resources in the study area.

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